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ABSTRACT

The Computerized Vocational Information System (CVIS) at Willowbrook High School in Villa Park, Illinois, uses the computer as a tool to help each student explore a wide range of occupations and educational opportunities with some feedback from his own record of ability, achievement, and interest. Computer-based guidance systems are considered a unique approach in the guidance and counseling field. CVIS is of particular interest because it is the most comprehensive system, it has had the largest number of student users, the longest use span, and the largest number of installations. A unique and practical feature is that the system is easily transportable. School districts in all parts of the country have implemented the system and have formed a consortium to assist one another in updating, revising and extending the system as well as validating available evaluation data on CVIS. CVIS not only provides a guidance function, but also includes counselor/administrative functions and computer-assisted instruction, which makes the program cost/effective. Other documents in this series are CG 008 165 through CG 008 168 and CG 008 170 through CG 008 176. (Author)

CASE STUDIES IN PRACTICAL CAREER GUIDANCE NUMBER 5

Computerized Vocational Information System

Willowbrook High School

Villa Park, Illinois

U.S. DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION

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Computerized Vocational Information System
Willowbrook High School
Villa Park, Illinois

Carol Ann Arutunian

American Institutes for Research
in the Behavioral Sciences
Palo Alto, California
June, 1973

The project reported herein was performed pursuant to a contract from the U.S. Office of Education, Department of Health, Education, and Welfare. The opinions expressed, however, do not necessarily reflect the position or policy of the Office of Education, and no official endorsement by the Office of Education should be inferred.

U.S. Department of
HEALTH, EDUCATION, AND WELFARE
Office of Education
Office of Planning, Budgeting, and Evaluation

This case study is one in a series of thirteen which was produced by the Youth Development Research Program of the American Institutes for Research under contract with the Office of Planning, Budgeting, and Evaluation of the U.S. Office of Education. The purpose of the contract was to examine the practical career guidance, counseling, and placement which is provided to noncollege-bound secondary level students. As part of the effort, programs which are making an illustrative attempt to deal with the needs of noncollege-bound youth were identified and described in case studies. Case studies have been written on the following programs:

1. Baltimore Placement and Follow-up Program
Baltimore City Public Schools
Baltimore, Maryland
2. Career Development Center
Troy High School
Fullerton, California
3. Career and Educational Planning Program
Pioneer Senior High School
San Jose, California
4. Career Guidance Program
Hood River Valley High School
Hood River, Oregon
5. Computerized Vocational Information System
Willowbrook High School
Villa Park, Illinois
6. Coordinated Vocational and Academic Education
North Gwinnett High School
Suwanee, Georgia
7. Developmental Career Guidance Project
Detroit Public Schools
Detroit, Michigan
8. Employability Development Team
Cleveland Public Schools
Cleveland, Ohio
9. Job Development Program
Cleveland Public Schools
Cleveland, Ohio
10. Kimberly Guidance Program
Kimberly High School
Kimberly, Idaho
11. Lenawee Vocational-Technical Center and Placement Program
Adrian, Michigan
12. Occupational Learning Center
Syracuse City School District
Syracuse, New York
13. Youth Career Action Program
San Jose Unified School District
San Jose, California

Other products of this contract include Practical Career Guidance, Counseling, and Placement for the Noncollege-Bound Student: A Review of the Literature, and the project's final report which is entitled Planning, Structuring, and Evaluating Practical Career Guidance for Integration by Noncollege-Bound Youths. The final report outlines a planning-evaluation model which program personnel may use in developing local career guidance counseling and placement services.

COMPUTERIZED VOCATIONAL INFORMATION SYSTEM
WILLOWBROOK HIGH SCHOOL
VILLA PARK, ILLINOIS

Abstract

The Computerized Vocational Information System (CVIS) at Willowbrook High School in Villa Park, Illinois, uses the computer as a tool to help each student explore a wide range of occupations and educational opportunities with some feedback from his own record of ability, achievement, and interest. Computer-based guidance systems are considered a unique approach in the guidance and counseling field. CVIS is of particular interest because it is the most comprehensive system, it has had the largest number of student users, the longest use span, and the largest number of installations. A unique and practical feature is that the system is easily transportable. School districts in all parts of the country have implemented the system and have formed a consortium to assist one another in updating, revising and extending the system as well as validating available evaluation data on CVIS. CVIS not only provides a guidance function, but also includes counselor/administrative functions and computer-assisted instruction, which makes the program cost/effective.

COMPUTERIZED VOCATIONAL INFORMATION SYSTEM

The program has helped me because it shows a clear picture of different occupations, scholarship availability, and college selections. The computer sorts information for you, gives suggestions, helps you make decisions.

--Chris

Introduction

Chris is referring to the Computerized Vocational Information System (CVIS) at Willowbrook High School in Villa Park, Illinois, a suburb of Chicago. Chris and other students use "TV-like" computer terminals called cathode ray tubes that permit periodic interaction with CVIS on a voluntary basis throughout their high school career.

Students usually begin to familiarize themselves with CVIS by planning their high school programs each year in interaction with it. As needs develop for long and medium range plans about occupational goals and their educational prerequisites, students interact with the computer at will either in conjunction with or independent from counseling. CVIS is not designed to replace counselors. It is a powerful technological tool that assists students and counselors in collecting and sorting information before the career decision-making stage.

Chris, a junior, recently used CVIS in conjunction with counseling. Chris was uncertain about occupational goals when he came to his counselor. The counselor recommended that Chris return for interaction with CVIS so that the system could review his prior occupational goals with him and help reconsider his occupational decision before developing educational prerequisites. Over several days, Chris went through occupational exploration again in CVIS, taking time with the help of the system to take another look at his interests, abilities, and accomplishments and to update them as he also reevaluated his occupational goals.

Chris first reviewed local job situations in relation to his occupational goal. He then went through apprenticeship possibilities available to him either locally or in the military. He reviewed technical and specialized schools in the local area and looked for community college possibilities that would provide him the background he needed to attain his occupational

goal. Finally, he went into the college selection part of the system, found what he wanted in the way of needed preparation, narrowed his choice of colleges with the aid of CVIS, and looked through scholarship possibilities to find money to support his new goal. This decision then caused him to call up his course pattern to determine if he had the needed prerequisites for his new choice. He found that he lacked a necessary mathematics course. Before leaving CVIS, he therefore scheduled himself into the needed course for the next semester. With this working through of new occupational and educational decisions and carrying printouts of the basic information he had called forth from CVIS, Chris returned to his counselor for review, more detailed planning, and firmer ideas about his future.

The exploring and informing functions of CVIS were expanded as the system was developed. At the present time, CVIS assists student exploration and provides information on command dealing with occupations, local entry jobs, local apprenticeship, military opportunities, local technical and specialized schools, local community colleges, all four-year colleges and financial aid for further education.

Teachers and librarians are encouraged to take advantage of CVIS' basic computer system to develop instructional programs. Programs currently exist for teaching ceramics and mathematics and for a few functions relating to location of data in the library.

The project was started in 1967 with the help of funds from the State of Illinois Board of Vocational Education and Rehabilitation, Division of Vocational and Technical Education. These funds took the project through initial development. As some of CVIS' programs became operational, School District 88, within which Willowbrook High School is organized, assumed responsibility for operational costs of the project. This responsibility was first taken by Willowbrook High School alone but is now shared by the two other high schools in the District. CVIS, therefore, serves all the high schools (approximately 9500 students) in its District. Computer programs are also available for several decisions needed in junior high school. In addition, the College of DuPage, the community college that provides computer capability for CVIS at cost, has developed coordinate programs for decisions of its students.

Willowbrook High School is the sole distribution source of CVIS. CVIS has been distributed to 54 sites throughout the country and is currently operational in 22 of these sites. By 1971, enough interest in using CVIS

in other locations existed to bring about the formation of a consortium of users other than School District 88. This consortium is made up of educational, nonprofit users willing to pay membership fees and to assess themselves to share the costs of updating of the system's national data files.

Now that CVIS is cost/effective for her own and other school districts, the Project Director currently devotes a major portion of her time to directing a new developmental effort, the computerization of a support system for career development from grade four through adulthood, including major emphasis on the teaching and awareness of decision-making.

Origins of the Project

The CVIS project arose from the belief of three counselors and a principal that it would provide a system to assist high school students in broad exploration of occupations in relationship to personal information, an approach that would be more stimulating (and therefore used more by students) than the traditional file cabinet and reference material, and a means of reducing some of the clerical duties of counselors.

The Project Director, who was then Director of Guidance at Willowbrook High School, was the prime mover in the project. She was joined by two counselors in the school, and a school psychologist participated initially as well. The Chairman of the Mathematics Department in the school joined the project at its inception because of his interest in using the computer in instruction. He did the actual computer programming required to implement the script-like material that the Project Director and counselors provided in the beginning. The math teacher made a system of it under the Project Director's guidance and supervision. As CVIS became operational, he moved to the College of DuPage and currently manages its computer center from which School District 88 purchases the computer time needed to operate CVIS.

At the inception of CVIS (planning and developing stages began in January 1967 and the program became operational in the fall of 1968) computer-based systems were in their infancy. Although several organizations in the United States were planning and developing such systems, only one was developed to the field test stage in 1967, Professor Joseph Impelleteri's project Computer-Aided Career Exploration at Penn State University.

Further discussion of computerized guidance systems by the counseling team resulted in development of a proposal to the Illinois State Board of

Vocational Education. This proposal stated five major goals:

1. To use the computer as a tool to provide students with an organized exploration of occupations.
2. To provide this exploration in light of the student's own abilities, interests, and achievements.
3. To teach a decision-making process.
4. To make career exploration more appealing to students than the current files.
5. To make career information readily accessible to counselors.

The needed planning phases were immediately approved by the Illinois State Board of Vocational Education and Rehabilitation, Division of Vocational and Technical Education. This Division substantially supported development (75%), field trial (75%), and dissemination (90%) of CVIS. School District 88 and the College of DuPage supplied the remainder of support necessary to implement the project.

Project Development

The project began at Willowbrook High School and developed through seven phases. The Project Director and two staff members were freed from their normal duties to work full time for three weeks in the summer of 1967 and part time during the school year on the construction of CVIS.

The first two phases of CVIS (January 1967-August 1967) consisted of a survey of all other computer-based vocational guidance systems then being developed, acquisition of elementary knowledge of computer programming and technology, and concentrated planning sessions to set the theoretical framework for the system.

Phase III (school year 1967-68) was devoted to carrying out the plans laid in the three-week planning session with the aim of accomplishing operation by the fall of 1968. Phase IV (October 1968-September 1969) found Willowbrook ready for operation with two student terminals. In addition to maintaining the ongoing operation of the vocational exploration system, the system was expanded during this phase.

In Phase V (1969-1970), CVIS became fully operational with students at Willowbrook High School, and service was extended to York High School. During this year 2,130 uses were recorded. This phase also included consolidation

of computer facilities at the College of DuPage and expansion of CVIS for use by students at the college and at a junior high school. Phase VI (1970-71) was devoted to revising and expanding CVIS. The most important aspect of this phase was the development of CVIS as an administrative tool for counselors and administrators in attendance reporting, scheduling of students, and other functions detailed in a later section. Phase VII (1971-72) brought further development of Willowbrook as a demonstration center, updating of the system, and expansions of the dissemination of CVIS.

Current Status of the Project

Target Population and Setting

Willowbrook High School is a comprehensive four-year (ninth through twelfth grades) high school of approximately 3,400 students, located 15 miles west of Chicago in Villa Park, Illinois. Villa Park has a population of approximately 25,000. The ethnic makeup of the student population is almost totally white. The community that Willowbrook serves is of upper middle-class socioeconomic level. Approximately 80% of the parents hold managerial, semi-professional, or professional jobs.

As a comprehensive high school, Willowbrook offers a wide variety of courses. Its curriculum is strong in vocational education offerings, including extensive vocational preparation in clerical-stenographic occupations and in printing, automobile repair, cabinet making, metal shop, electronics, and drafting. There are four cooperative work programs--office occupations, distributive education, diversified occupations, and cooperative work training. There is also a broad program of courses for college-bound students, including four years of mathematics and science.

Yearly follow-up studies of Willowbrook graduates indicate that approximately 45% attend four-year colleges; 25% attend the local community college; 10% attend technical or specialized schools; and 20% enter the job market immediately after high school.

Goals and Objectives

CVIS should be viewed as a tool for exploration of occupations and educational opportunities and assistance with choices. It is an automated library

of information, not a support system for total career guidance. In this light, the goals and objectives of the program are as follows:

1. Students who use the CVIS system will perceive a larger number of occupations as possible options after use than before use.
2. Students who use the CVIS system will select an educational-vocational level after use which is in greater congruence with objective data about school ability and achievement than that selected before use.
3. Students who use the CVIS system will have greater range and accuracy of information about tentatively chosen occupations after use than before.
4. Students who use the CVIS system will exhibit increased vocational maturity as measured by the scales of the Career Development Inventory, as a result of using the system.

Project Staff

CVIS is used in District 88 high schools within an organization consisting of a principal and three assistants; a director of guidance; eleven counselors, one of whom is directly identified as a vocational counselor; a clerk; teachers; and students. The principal has overall administrative and financial responsibility for CVIS within the authority of the superintendent of schools. One of the assistant principals has responsibility for student records, class scheduling, class lists, report cards, and student transcripts. The Director of Guidance and the guidance counselors have responsibility for students' use of CVIS for course selection and educational decision making. The Director is also responsible for seeing that new scripts and their programs are provided as needed. The Vocational counselors of the District share the work entailed in yearly updating of the vocational-technical school file and the local job file. College and occupational data files are updated through subcontracts awarded by the CVIS consortium. The clerk minds the five terminals for student use.

Facilities, Materials, and Support

CVIS students interact with an IBM System 360-40* computer by means of terminals connected to it by telephone lines. These terminals display

*This computer has only one-third of its capability (40K) assigned to CVIS. It performs a host of other functions for the College of DuPage and the DuPage County Data Processing Cooperative.

messages on a TV-like screen to which students respond by typing on a typewriter-like keyboard. There are eight of these terminals currently in use at Willowbrook High School. Five of these terminals are located in a room near the counseling department. One is located for use by the assistant principal, one is in the CVIS Demonstration Center, and one is in the library for use by teachers in developing computer-assisted instruction.

The "conversation" is carried on by transmission of data from the terminal's keyboard over a phone line to the central processing unit of the computer, located at the College of DuPage, and back to the cathode ray tube, a virtually instantaneous process, unless the computer already has a long queue of requests when the student enters his. Students may also make a copy of messages or data with a complementary printer. Audio-visual materials are also available for use in conjunction with the junior high computerized material.

The computer programs allow multiple opportunities for making choices, changing plans, exploring alternatives, and seeking assistance from counselors. The program also records the path of exploration followed by a student so that his last use of the system can be recapped for him when he returns.

The guidance program currently has nine main branches at the secondary level:

1. The College Branch

- a. The first subsystem allows students to review such topics as college entrance requirements, college visits, financial aid, college scheduling, and work-study programs.
- b. The second subsystem allows students to select a list of colleges for further consideration. One thousand five hundred ten four-year colleges are filed by majors offered, size, location, cost range, admission selection and so on. The student chooses the characteristics important to him. His interaction with the system is designed to narrow down his choices based on the characteristics he prefers most. The code numbers and names of colleges having the combination of characteristics requested are then printed.
- c. The third subsystem allows students to enter the code number of the specific college and to receive three displays of information--majors offered, admission requirements, and general information (cost, size, and location).

2. Community College Branch--students learn about admission requirements, costs, and curriculum at the local community college.
3. Technical and Specialized School Branch also has three subsystems like the ones for the four-year college branch. These are general and concern the selection of a technical or specialized school, selection of schools in a 50-mile radius, and specific information about specific schools.
4. The Apprenticeship Branch is a teaching script about apprenticeships and how students can learn about them locally. Also included is a list of companies that offer apprenticeship opportunities.
5. Local Jobs Branch consists of computer-assisted instruction about how to find and interview for a job, a job selection game based on 15 variables that should be considered by an applicant, and a catalogue of local companies divided by the types of entry jobs they offer. Students choose an occupational category and receive a list of companies in DuPage County having entry level positions in that category.
6. Military Information Script provides students with information about draft obligations, ROTC units, and military academies.
7. Select-a-Course allows students to register themselves for a program of courses for the following year. This part of the program reviews students' grades, rank in class, and progress toward completion of graduation requirements. The program explains required courses and registers students automatically for them. Students can explore elective courses and the program assists them in deciding on a full schedule of courses in keeping with prerequisites and career plans.
8. The vocational exploration program reviews with the student his ability as measured by tests, his rank in class, and his interests as measured by tests. On the basis of these and the students' choice of educational goals, the system produces a list of occupations for exploration. The student can then receive 50-word definitions or 300-word occupational briefs of as many occupations as he wishes.
9. Financial aid search and data base of 172 nationally available scholarships.

At the community college level, the secondary program is adapted for use by the community college students. At the junior high school level, the program has a vocational exploration branch and twelve sets of visual materials (not included in the computer tape).

No discussion of the CVIS program would be complete without highlighting its administrative functions at the secondary level. Willowbrook

High School is currently run on an "open campus" basis. This arrangement has placed new demands for student accounting on the administration. CVIS is therefore now currently employed extensively in recording student absences and in providing counselors with daily reports of such absences so that they can follow-up on a long string of absences. This accurate report of students' attendance by period is used by deans and counselors to deal with students and parents about attendance problems. The students' monthly attendance data are enclosed with report cards to parents. Another advantage of accurate attendance reports is that there is increased money from the state due to accurate reporting. Formerly, if a student were reported absent the first two periods of the day, he was entered on state reports as a total day of absence, and therefore a loss of funds. Now all periods of absence for all students are tallied and divided by five periods (equal to one school day) to calculate total absent days.

In addition, administrators use the system to permit students to register for courses of their choice and to create the class and teacher schedule resulting from this more individualized selection of courses. Counselors use the system to change students' current schedules provided that classes are open and deadlines for change have not expired. When the student is re-scheduled the teacher is informed by the following day through printed attendance cards. Also at the secondary level, student record formats have been designed to permit feedback to students, retrieval by counselors and advisers, printing of transcripts, and preparation of state reports. CVIS has the capability to update student records, the school's master schedule, guidance scripts, and data files (college, occupations, technical and specialized schools). CVIS provides an accounting of student use of the system.

When students come across situations where more detailed information is needed or the exploration requires other resources, they are referred by the program to books or other resources located in the school.

CVIS has other materials for students and for dissemination of the project to other schools in the district and to 54 other sites throughout the country. For example, the state of Texas is one site. Some of these materials include an audio-visual student orientation presentation; a 20-minute, 16mm film entitled "Saturday's Child" for orientation of students, faculty, community, and the professional public; a computer documentation

manual; an implementation manual; an operator's manual; two student manuals (secondary and junior high); a counselor's manual; and several descriptive brochures on the CVIS project.

An additional feature of the CVIS program was the use of community support in developing the program. Local businesses and industries continue to play an important role in updating CVIS data files and programs. Vocational counselors in the school district keep the "Local Jobs" data file updated by means of a survey of local businesses and industries. The Kiwanis Club assisted the CVIS staff with the design, field test, and revision of this form. The technical/specialized schools data file is updated by a direct mailing each year to these schools.

Student Activities

Students are scheduled to use the system on a sequential basis at Willowbrook. Freshmen are scheduled to use the computer for registration (all students cannot be registered this way because there are not enough terminals). Sophomores are scheduled for vocational exploration. College-bound juniors are scheduled for college selection and community college. College-bound seniors are scheduled for financial aids. Noncollege-bound juniors and seniors are scheduled for apprenticeships, local jobs, trade and technical schools, and the military. It is assumed that the students will get this type of assistance from their counselor (ratio of one counselor to 350 students) if not from CVIS.

Only a few teachers use CVIS for instruction. An art teacher with the help of the new chairman of the Mathematics Department developed 30 units in seven areas of instruction relating to the use of glazes. Because the chairman of the Mathematics Department teaches an extension course in computer-aided instruction at Willowbrook, several teachers other than the art teacher have become interested in using CVIS further in their classwork. A librarian is working up recallable lists of materials for teacher use in borrowing from the materials center. Once instructional material has been developed, it can be added to the system by punched card or on-line from the terminal. This capability is performed at both secondary and community college levels.

Directors of Guidance and their counselors in District 88 have not yet worked out patterns that they want to adopt in using CVIS in their programs. Thus, for the most part, students are encouraged by the directors and counselors to use CVIS on their own. Efforts are made to familiarize students with the system. A clerk works regularly in the room with the terminals. The

clerk helps students to operate the system should the student be experiencing difficulty. However, CVIS is fairly self-explanatory after a 20-minute orientation and briefing. When the student signs on, he can play tic-tac-toe with CVIS just to familiarize himself with its use and response capabilities. From there the student can go pretty much at will to programs in the system.

Several teachers in conjunction with the vocational counselor at the high schools offer instruction in occupations. The counselor and these teachers rely on CVIS in conjunction with their instruction. CVIS gives the students a chance to explore possibilities related to their interests and abilities. The class then gives them opportunity to learn more about possibilities, to discuss possibilities with the teacher and other students, and to reconsider occupational selection for themselves at any time.

Because CVIS is programmed to react on demand but not to capture students' interest until they come to the system, no assessments of student needs were carried out except for the informal judgment that students needed occupational information. As the system took shape and students began using it, it became apparent that there was enormous demand for accurate information. The Project Director has therefore taken pains to eliminate errors as quickly as they are located, to keep information up to date to the extent that resources permit, and to make information as detailed as system storage and recall possibilities permit. It also became apparent that required detail about occupations or educational opportunities is considerable once a decision is reached and a tentative choice has been made. One junior reports that the college programs do not really help her; she is looking for more complex information on specific colleges. The general information available on all colleges is of little help to her. This complaint merely points to the fact that CVIS is a limited purpose instrument, however widespread the functions are that it can do in its limited way.

Broad Impact and Evaluation

CVIS grew out of a general assessment that students needed more (and more stimulating) information than was available in 1966. As the needed computer programs were written, the programmers first played the role of students so that they could get the program to do what was considered desirable. The tentative programs were then implemented on the computer and students were permitted to react directly. Students were watched to determine what difficulties they experienced, and a few were interviewed later

to obtain such information formally. Those interviewed were also encouraged to suggest modifications that the program needed. Relevant and possible suggestions were incorporated in revised versions of the computer programs. As these pilot programs became more effective, counselors started using the programs in conjunction with their students. This gave the counselor an opportunity to see how students used the programs, to hear their objections and complaints, and to forward or correct difficulties.

One of the best ways to develop a feel for the methodology and the impact of the revised program is a review of the reactions of students, counselors, and teachers when they were asked to comment on the project's effectiveness.

One student was helped in the decision-making process when the computer narrowed his choices to two colleges. Another student recalled an incident related to class selection. The computer explained the choices effectively and helped the student make appropriate decisions related to his future goals. A third student discovered that more choices were available to her by using CVIS. The program helped her make a career choice and gave her new ideas in related fields. Another student recalled an incident related to scholarship information. This student thought the information was encouraging because it related directly to him.

* Interviews with counselors produced similar recollection of positive incidents. Two counselors recalled incidents in which students unsure of their career choices came to counselors. After using CVIS two or three times, these students had made more definite career choices. One counselor recalled an incident in which the computer settled an argument between a father and son over career information. The Director of Guidance recalled an incident relating to a recent high school graduate attending the local junior college. The student came in for posthigh school planning in the nursing field. The system told her exactly what she needed to know for her field.

Teachers were also able to recall positive incidents relating to the use of the system. Two teachers interviewed remembered that students learned more about themselves and developed an increased awareness of the possibilities they had in career selection. Two teachers also spoke favorably of the opportunity that CVIS gave them to use their own programs in conjunction with art and mathematics instruction.

Summative evaluation data of one or another kind have been collected on CVIS over the years of its operation. Data are available on the patterns of use in two years, 1969-70 and 1970-71 (Harris, 1972, p. 33). A higher proportion of boys than girls used the system, particularly in 1970-71. Use varies with grade; the highest proportion of use is in grade 11, and the next highest is in grade 10. Use varies with rank in class. Middle ranks used it more than high and low ranks in 1970-71. High ranking students used it most in 1969-70.

Data have also been collected on opinions that students offered on using the system during March 1971 (Harris, 1972, pp. 34-35). Most students gave favorable responses to the system in its offering of guidance information. About two-thirds of the students have an occupation in mind when they come to use the system. The system therefore does not do much to change or enlarge the choices of these students. Only a small fraction who come to the system without a choice lack one or still feel confused after using the system. Three quarters of the students feel that CVIS does a good job of giving information.

Two studies have contrasted effects of using CVIS with those of using a counselor for the same purpose. Melhus (1971) structured such a contrast by asking his CVIS users to use the vocational exploration branch only once and asking counselors to interview students in their group about their vocational plans and to give them the best attention possible thereafter. Melhus found that high-ability students showed no difference whether they used CVIS or saw a counselor. With low-ability students, the group with counselor attention made greater progress in crystallizing their plans which indicates a student's ability may have some bearing on the contrast.

Price (1971) did a similar comparative study using the course selection feature in CVIS. No significant differences in course information, evaluated selections, or course changes or grades over the ensuing year appeared with regard to treatment.

Harris (1972) assessed the effect of more extended use of the vocational exploration system (four uses in a two-month period) on each of the four areas listed earlier in this section as specific student outcomes desired in the system. Harris found that the four uses of the system in a two-month period had no effect on either the number of occupations that male or female students view as personal options at the sophomore level or increase in the congruence between stated aspiration levels and objective data about student

abilities. Harris reports that students change significantly in the accuracy and range of information they possess about their chosen occupation and in vocational maturity. However, other data that Harris reports indicates that about two-thirds of the students who use the system come in with an occupation selected.

Students participate in the evaluation process. Some scripts have evaluation items at the end of them to which students respond at the terminal. Also, questionnaires are distributed yearly to a random sample of users, and evaluation reports are beginning to come in from other sites. The results of these evaluations indicate that students have favorable responses to CVIS (91%); students feel that CVIS does a good or fairly good job of providing information needed about occupations (76%); and students feel that CVIS does a good or fairly good job of relating ability, grades, educational plans, and interest to occupations (74%).

Future of the Project

CVIS has become a part of the regular operating programs of the three high schools in District 88. Administrative, guidance and teaching uses of CVIS are therefore a part of regular programs. In addition, CVIS receives operational support from District 88.

Further developments in CVIS being done by members of the CVIS consortium include: (1) adaptations for four-year college level, (2) adaptations for use by adult populations, (3) translations for use on a variety of computers and operating systems, (4) translation to allow use on typewriter terminals instead of cathode ray tubes, and (5) use in a variety of settings such as mobile vans and shopping malls.

Conclusions

CVIS is effective; its administrative systems are used by high school principals and their assistants in the daily management of secondary schools organized for more individualized education.

Guidance systems are used by students who give them credit for helping them to make choices but indicate that they are not sufficient to help them clarify initial decisions when choices have been made and implementation information is needed. Counselors find these systems effective in relieving them of responsibility for information-giving about education and occupation.

Counselors like the added time that they can give to individual counseling or group work of their choosing. The vocational exploration system seems to get results such as that counselors achieve with brighter but not duller students. The system does not cause much change in occupational choice and its context, but it does enlarge vocational maturity and the accuracy and range of occupational information they possess. Finally, the course selection program gets as good results as counselors achieve.

The strategy adopted at Willowbrook needs careful review by school systems considering adoption of CVIS. Counselors need familiarity with CVIS to help their students benefit from their private sessions with CVIS. Placing a terminal in the counselor's office provides that familiarity and helps counselors overcome the original aversion they have to sharing with a computer system some of their relationships with students. One of the counselors engaged in the maintenance of CVIS reports that counselors at Willowbrook took a year to work through aversions to the system. In this period, the times when the system fails or reacts slowly because of demand from CVIS and other uses at the College of DuPage aggravate counselors. Counselors currently report that they cannot use CVIS as effectively in their counseling as they could when the student, CVIS, and the counselor were more intimately involved as they were when the terminal was in the counselor's office. However, displays are available to the counselor that summarize each student's use of the system.

CVIS is an effective integrated educational data processing system. Costs are sufficiently reasonable to be borne by a district that uses the full capacity of the system. Students like the system, because they grow in self-knowledge from using the system. Counselors who take the time to work with students and the system will find that their educational and vocational counseling activities are aided by this resource.

Transportability

CVIS is highly transportable. Tapes, documents, and needed training devices and use manuals are available. Visits are welcome, and training conferences are provided on request at no cost at the Willowbrook site. Resources required for the implementation of CVIS include:

1. Access to an IBM 360 or 370 series computer.
2. The \$150 package from Willowbrook (computer tape, technical documentation, implementation manual, operator manual, student manuals, counselor manual).

3. Local guidance support to localize some scripts, localize some data files, train counselors, orient students, and do continuing maintenance on scripts and files.
4. Technical support to make local adaptations such as interface of local student records with CVIS student records, order terminal equipment, get the system operational, and do continuing maintenance.

A special factor that has helped the program at Willowbrook is the strong administrative support in the school and the district. The principal at Willowbrook was particularly helpful when the project started. He was willing to innovate and trust the team. The absence of barriers allowed the development team to make unrestricted progress. The fact that school principals and the Superintendent recommended investment of local funds in the operation of CVIS has made it one of the few computer guidance systems in daily operation at this minute. Such administrative support would be one challenge faced by anyone attempting to replicate the program.

CVIS has been transported. It was developed at Willowbrook High School, and is now used at the College of DuPage as well. It has also found its way into two other high schools and one junior high school in District 88 so that it is used on a regular basis in all District high schools at present. The system is also operational in areas where the target population is quite different from that at Villa Park. Chicago, Rockford, and St. Louis are a few of these sites. No hard data are available on the effectiveness of the program in any of these places, but nonscientific comments indicate that students like it and have not had any difficulty in using it.

PROGRAM OUTLINE

Goal:

CVIS is a tool to help each student explore occupations and educational opportunities with some feedback from their record of ability, achievement, and interest. The purpose of the project is to provide to schools a cost/effective computer package that serves, student, counselors, administrators, and teachers.

Students Served:

All high school students in School District 88 (approximately 9,500), a suburban area of Chicago. Community college students and some junior high school students in the District are also served by CVIS.

Staff:

CVIS is administered by the Principal at Willowbrook High School. Project staff includes the Project Director, the Director of Guidance, eleven counselors, three assistant principals, and a clerk (who assists students in the use of the system).

Funding Source:

Planning phases for CVIS (1966-1972) were substantially supported by the Illinois State Board of Vocational Education and Rehabilitation: development and field trial 75%; and dissemination 90%. District 88 provided remaining support needed during these phases. Currently the project is supported 100% by District 88 funds.

Materials, Facilities,
and Support:

Access to an IBM 360-40 Computer; eight TV-like terminals (five are for student use). Ten distinct programs are in use in the system by students from career exploration at the junior high level and senior high level; local jobs and apprenticeship programs; four-year colleges, technical-vocational schools; and community colleges (information on schools includes entrance requirements, majors offered, and so on). Students may also use the program to register for classes by Select-A-Course. Local guidance and technical support needed for updating local scripts.

Student Activities:

Students interact with the system periodically throughout their high school career for descriptions of occupations and career opportunities and for scheduling of classes. Counselors and administrators use CVIS to relieve them of clerical functions and for accurate reporting on student records and attendance. Computer-assisted instruction is another activity offered by the system.

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